



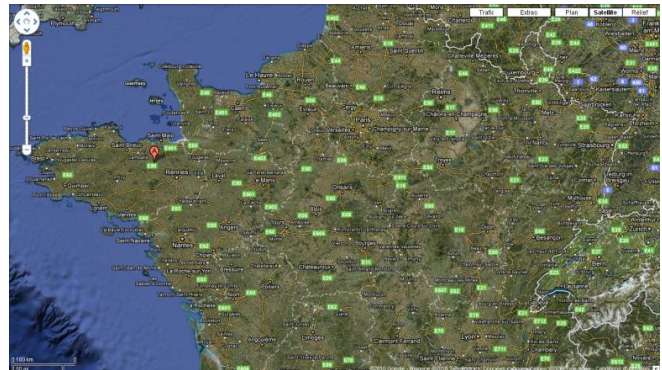
# IMPACCT CASE STUDY No. 5

Integrated Management Options for Agricultural Climate Change Mitigation

## Le fouesnard, Yvignac la tour, France

This case study farm is located in the region of Bretagne in north-western France. It is a 146 ha mixed holding growing field crops and incorporating a dairy enterprise.

The farm is located in a watershed area known as the Haute-Rance. The soil is either silt or clay and it has a coastal climate. Fields are bounded by hedgerows and banks. In the last year a significant oak and hazel tree planting programme was undertaken. There is also a wetland area under afforestation.



Location of the case study farm

The crops grown include 39 ha of wheat, 35 ha of maize and additional areas of triticale, peas and buckwheat. There are also areas of Lucerne/rye grass/ clover mix and temporary meadows (20 ha).

The dairy enterprise has 65 dairy cattle, 60 heifers and 25 beef steer.

The farm has taken several steps towards mitigating climate change and reducing farm costs. These are summarized below.



Maize crop

- During 2000 a mechanical ventilation system was installed in the dairy unit to improve air circulation and so improve animal welfare. This has increased milk production and so decreased the amount of greenhouse gases produced per litre of milk.
- In the summer of 2009 the old farm tractor was replaced with a new one that is much more fuel efficient. This has saved 12 litres of diesel fuel per work hour equivalent to 3000 litres per year. Thus greenhouse gas emissions have been considerably reduced. However, there was a significant capital cost outlay for the new tractor of around €100,000.
- Soil management activities have changed on the farm in recent years. This has included a change from conventional tillage to minimum tillage and direct seeding on some plots. This has resulted in less fuel consumption, a decrease in soil erosion and should also mean less nitrogen leaching. There has also been an increase in soil organic matter of 1% noted.
- Crop nutrition practices have evolved over the last seven years. The farm has modified its rotations and now makes much greater use of legumes as catch crops.

- The changes in cropping and soil management mean that there is now much less mineral fertilizers used on the farm and no facilities for storage are required as when it is purchased it is used immediately. The use of mineral fertilizers has decreased from 30 tonnes per year to 2 tonnes per year. As well as saving costs and reducing greenhouse gas emissions on the farm this will also mean less produced during manufacture.
- With respect to crop protection, greater use of disease resistant varieties is now made and several different varieties of each crop are used on the farm. For example four different varieties of wheat and five varieties of maize are planted on the farm.
- Herbicides, when needed, are applied at low doses. The crop rotation has also been adjusted and includes a greater variety of crops.
- These changes have reduced the use of pesticides and the tractor is used less thus reducing greenhouse gas emissions.
- The farm makes maximum use of the farm derived manures and slurry. This is spread on the cereal crops and any excess straw is buried in the soil. This has increased soil organic matter, increased soil carbon sequestration and the biological activity in the soil. This has also meant that less mineral fertilizer is used.
- The livestock diets have been modified such that the amount of concentrate distributed is reduced. Alfalfa and mixed grain/legumes have been added to the cattle diet. Consequently there is less consumption of soybean meal and this change has produced an increase in milk production.
- Since the implementation of the European Water Framework Directive in France the farm has modified its management of environmental areas. This has meant that hedgerows on the farm have been extended and maintained and that grass strips around the arable areas have been introduced. This offers potential to increase carbon in plant biomass and the soil.



- The grass strips are not treated with pesticides or fertilizers. This has resulted in less loss of nitrogen to the environment, less use of pesticides and fertilizers and an increase in farm biodiversity has been noted.

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